

1. A biologically active peptide at least 90 % identical to a peptide consisting essentially of the formula:

(b) fragments thereof containing amino acids 1-29, 1-30, 1-31, 1-32, or 1-33;

(c) pharmaceutically acceptable salts thereof; or

(d) ~~N- or C-~~derivatives thereof;

wherein:

X₀₁ is desamino Ser, desamino Ala or desamino Gly,

provided that said peptide is not desamino Ser¹ hPTH(1-31)NH₂ or desamino Ser¹ hPTH(1-34)NH₂.

2. A biologically active peptide consisting essentially of the formula:

(a) X₀₁ ValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsnSerMetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID NO:1);

(b) fragments thereof containing amino acids 1-29, 1-30, 1-31, 1-32, or 1-33;

(c) pharmaceutically acceptable salts thereof; or

(d) N- or C- derivatives thereof;

wherein:

X₀₁ is desamino Ser, desamino Ala or desamino Gly,

provided that said peptide is not desamino Ser¹ hPTH(1-31)NH₂ or desamino Ser¹
hPTH(1-34)NH₂.

3. The peptide of claim 1 which is:

Desamino-AlaValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsnSer
MetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID NO: 5).

4. The peptide of claim 1 which is:

Desamino-GlyValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsnSer
MetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID NO: 2).

5. The peptide of claim 1 wherein the peptide is labeled with a label
selected from the group consisting of: radiolabel, fluorescent label, bioluminescent
label, or chemiluminescent label.

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6. The peptide of claim 5, wherein said radiolabel is ^{99m}Tc.

7. A pharmaceutical composition comprising

(a) a biologically active peptide at least 90% identical to a
peptide consisting essentially of the formula:

X₀₁ is desamino Ser, desamino Ala or desamino Gly; and a pharmaceutically acceptable carrier,

(a) a biologically active peptide consisting essentially of the

~~X₀₁ValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsnSerMet
GluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ
ID NO:1);~~

(d) N- or C- derivatives thereof;

wherein:

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X₀₁ is desamino Ser, desamino Ala or desamino Gly; and a pharmaceutically acceptable carrier.

9. A nucleic acid molecule consisting essentially of a polynucleotide encoding a biologically active peptide which has an amino acid sequence selected from the group consisting of:

(a) X₀₁ ValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsn SerMetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID NO:1);

(b) fragments thereof containing amino acids 1-29, 1-30, 1-31, 1-32, or 1-33;

wherein:

X₀₁ is desamino Ser, desamino Ala or desamino Gly, provided that said peptide is not desamino Ser¹ hPTH(1-31)NH₂ or desamino Ser¹ hPTH(1-34)NH₂.

10. A recombinant DNA molecule comprising: (1) an expression control region, said region in operable linkage with (2) a polynucleotide sequence coding for a biologically active peptide, wherein said peptide is selected from the group consisting of:

(a) X₀₁ ValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsn SerMetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID NO:1);

(b) fragments thereof containing amino acids 1-29, 1-30, 1-31, 1-32, or 1-33;

wherein:

X_{01} is desamino Ser, desamino Ala or desamino Gly,

provided that said peptide is not desamino Ser¹ hPTH(1-31)NH₂ or desamino Ser¹ hPTH(1-34)NH₂.

11. A method of preparing a biologically active peptide comprising introducing into a host the recombinant DNA molecule of claim 9, and causing expression of said molecule.

12. A method for making a recombinant vector comprising inserting a nucleic acid molecule of claim 8 into a vector.

13. The recombinant DNA molecule of claim 9, wherein said control region includes a bacterial, viral, fungal or mammalian promoter.

14. A host cell containing the recombinant DNA molecule of claim 9.

15. The cell of claim 13 which is prokaryotic.

16. The cell of claim 14 which is bacterial.

17. The cell of claim 13 which is eukaryotic.

18. The cell of claim 16 which is a yeast cell or a mammalian cell.

19. A method for treating mammalian conditions characterized by decreases in bone mass, which method comprises administering to a subject in need thereof an effective bone mass-increasing amount of a biologically active peptide, wherein said peptide comprises an amino acid sequence at least 90% identical to a member selected from the group consisting essentially of:

(a) X_{01} ValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsnSerMetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID NO:1);

(b) fragments thereof containing amino acids 1-29, 1-30, 1-31, 1-32, or 1-33;

(c) pharmaceutically acceptable salts thereof; or

(d) N- or C- derivatives thereof;

wherein:

X_{01} is desamino Ser, desamino Ala or desamino Gly, provided that said peptide is not desamino-Ser¹ hPTH(1-31)NH₂ or desamino Ser¹ hPTH(1-34)NH₂; and a pharmaceutically acceptable carrier.

20. A method for treating mammalian conditions characterized by decreases in bone mass, which method comprises administering to a subject in

need thereof an effective bone mass-increasing amount of a biologically active peptide consisting essentially of the formula:

(a) X_{01} ValSerGluIleGlnLeuMetHisAsnLeuGlyLysHisLeuAsn
SerMetGluArgValGluTrpLeuArgLysLysLeuGlnAspValHisAsnPhe (SEQ ID
NO:1);

(b) fragments thereof containing amino acids 1-29, 1-30, 1-31,
1-32, or 1-33;

(c) pharmaceutically acceptable salts thereof; or

(d) N- or C- derivatives thereof;

wherein:

X_{01} is desamino Ser, desamino Ala or desamino Gly,
provided that said peptide is not desamino Ser¹ hPTH(1-31)NH₂ or desamino Ser¹
hPTH(1-34)NH₂; and a pharmaceutically acceptable carrier.

21. A method for determining rates of bone reformation, bone
resorption and/or bone remodeling comprising administering to a patient an
effective amount of a peptide of claim 4 and determining the uptake of said
peptide into the bone of said patient.

22. The method of claim 19, wherein said effective bone mass-
increasing amount of said peptide is administered by providing to the patient DNA
encoding said peptide and expressing said peptide in vivo.

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26. A method of claim 19, wherein the effective amount of said peptide for increasing bone mass is from about 0.01 $\mu\text{g/kg/day}$ to about 1.0 $\mu\text{g/kg/day}$.

27. The method of claim 19, wherein the method of administration is parenteral.

28. The method of claim 19, wherein the method of administration is subcutaneous.

29. The method of claim 19, wherein the method of administration is nasal insufflation.